APPENDIX

APPENDIX

(910a)*

Opinion (Decision)

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF NEW YORK

Civil Action No. 4168

DEAN A. LYON, 1821 P Street, S. E., Washington, D. C., *Plaintiff*,

v.

BAUSCH & LOMB OPTICAL Co., 626 St. Paul Street, Rochester 2, New York, *Defendant*.

Decided December 31, 1953.

B. Edward Shlesinger, Rochester, N. Y., Attorney for Plaintiff; Cushman, Darby and Cushman, Washington, D. C.; John W. Malley, C. Willard Hayes, of counsel.

Edward H. Cumpston, Rochester, N. Y., Attorney for Defendant; G. A. Ellestad, of counsel.

This case involves a claim for damages based upon the alleged infringement of plaintiff's patent No. 2,398,382 on a method for applying hard, durable, low-reflecting films of inorganic salts on the surfaces of optical elements. At the trial the complaint was amended to add a claim for damages for unjust enrichment. The invention covered by the patent is an improvement in the art of applying a stable, water-insoluble, evaporated, inorganic salt coating (notably magnesium fluoride) on the surfaces of optical elements. Prior to the invention optical elements had been coated with such materials but the coatings had not been consistently rugged and durable. Handling, usage, and climatic conditions had tended to damage or

* The trial Court's opinion and findings are for convenience hereinafter reprinted from Volume II of Defendant-Appellant's appendix in the Court of Appeals, with the "DA" page numbers (910a-947a) from that appendix being indicated.

remove the coatings. The plaintiff's method provides for the formation of a consistently hard, durable and tenacious coating by heating the optical surfaces to an elevated temperature while they are in a vacuum chamber, such as a bell jar, and in evaporating suitable inorganic salts to the optical surfaces in the vacuum chamber while the surfaces are maintained at an elevated temperature. The need for such rugged coatings had been felt in the art since the time it was first learned that such evaporated coatings would add to the efficiency of optical elements. The lack of consistent ruggedness of the coatings had imposed inherent limitations on their use in the

industry. It had been generally regarded as necessary to limit the use of coatings to inside surfaces where they were protected from handling and to leave the outside surfaces uncoated because of the risk of damage to unprotected surfaces. Prior invention had provided means for hardening the coated surfaces by baking the optical elements in air after they had been removed from the vacuum chamber. This method was commonly referred to as post-baking. Prior methods had also been used to pre-heat the optical elements to clean them before they were placed in the vacuum chamber. Means had also been used to get a completely clean condition within the vacuum chamber by creating an electrical discharge in the vacuum chamber, known as "glow discharge." All of such prior methods left much to be desired in respect to the quality of ruggedness and durability of the coated surfaces.

In the latter part of 1940 the Naval Gun Factory at Washington was interested in putting into production on a mass scale the coating of optical elements for the Navy. It had been discovered by naval authorities from examination of a German bombsight in 1940 that the Germans had been coating optical elements for at least 5 years. The plaintiff had had some experience in the technique

of applying coated films in vacuum. He was hired as a civilian employee at the Naval Gun Factory to develop for the Navy a program in setting up the production of coated optical elements for Navy use. He reported for work in January of 1941. After experimenting with the known methods of hardening evaporated films he concluded that the films so produced were too soft for Navy use. During the course of his experiments at the Naval Gun Factory in June of 1941 he hit upon the idea of heating the optical elements to be coated in the vacuum chamber and maintaining the heated condition of the elements while the evaporated coating was being applied in the

vacuum. Further experiments along this line convinced him that the use of this method of hardening the coatings provided consistent hardness and adherence of thin films so applied. After repeated tests for hardness and durability, and after the application of the process to actual optical instruments such as binoculars and submarine periscopes, the method was eventually applied to practically every type of optical instrument used by the Navy. It was also adopted by the War Department for the Army and after the Second World War by the optical industry generally. Plaintiff's application for a patent was filed November 17, 1942. The patent was granted April 16, 1946.

The defendant was engaged during the Second World War in performing contracts with the United States Government for the manufacture of optical instruments for the Army and Navy. In connection with its work under such contracts officials of the defendant visited the Naval Gun Factory in 1942 and inspected the work being done there with the plaintiff's process in the coating of optical elements for the purpose of adopting it in its manufacture of optical instruments for government use under its contracts. As required by its contracts with the Government, it coated optical elements produced for the Gov-

ernment using the plaintiff's method for hardening the coatings. After the Second World War the defendant continued to use plaintiff's method for coating optical elements in its commercial manufacture of optics not made for use of the Government. Plaintiff's offer of a license under his patent to the defendant for its use in its commercial manufacture of optics was rejected. Hence this suit.

Defendant asserts that the patent is invalid for lack of novelty and invention over prior patents cited by the Examiner. Plaintiff's patent specification shows prior knowledge of metallic fluoride reflection-reducing films and the

practice of pre-heating the surface to be coated to improve the tenacity of the film to the surface and to improve the ruggedness of the film itself. It also shows prior knowledge of post-baking in air to improve the tenacity and ruggedness of light transmission films. Heating in the vacuum chamber, while a coating is being evaporated on to the optical surface, had not been disclosed in the art of applying inorganic salts to an optical surface. Darrah (Patent No. 1224339) disclosed coating a hot metal powder such as aluminum or zinc onto a hot metal base such as iron in the presence of a partial vacuum. The coating metal is absorbed into the metal base. Cartwright (Patent No. 2281474) disclosed the method of coating an optical element with a reflection-reducing inorganic salt such as magnesium fluoride by evaporating in vacuum. He follows this treatment in vacuum by post-baking in air to harden the coating. Sabine (Patent No. 2301456) refers by inference to the post-baking in air used by Cartwright. Prior patents (Macksoud No. 2217228 and Birdseye No. 2237328) had disclosed the simultaneous heating and coating of the inside of a lamp bulb in a vacuum with an evaporated metallic coating. These two patents related to the use of metals to form opaque, reflective coatings in a field not related to the art of coat-

ing optical elements. It was not obvious to those working in the field of coating optical elements with thin films of inorganic salts to use the step of heating in the vacuum shown by Macksoud and Birdseye working in a different field with metals. The plaintiff's method of hardening the coated optical surface provided an improved, durable and tenacious coating such as had never been obtained by prior patentees. Plaintiff's process removed the inherent limitations of the use of coated optics to protected surfaces and made such use available for general application, including application to external and unprotected optical surfaces without risk of damage from assembling,

handling, usage and atmospheric or climatic conditions. This was a distinct advance in the art. All of the patents referred to above were considered by the Examiner in the Patent Office. Plaintiff's disclosure was addressed to the problem of soft coatings, coatings too fragile to permit their use in general application in the optical industry because of the risk of damage to the coatings from ordinary usage and handling and atmospheric conditions. Plaintiff's method of hardening was a successful solution of the problem. The presumption of novelty and invention is strengthened since the patents relied on to show lack of invention were considered by the Examiner. There was no showing at the trial that the Examiner was wrong in his conclusion. *J. A. Mohr and Son* v. *Alliance Securities Co.*, 14 F. 2d 799. *Celanese Corp.* v. *Essley Shirt Co.*, 98 F. 2d 895.

Defendant asserts that the patent is invalid by reason of patents, publications, and admissions of the plaintiff at the trial, which material was not before the Examiner. Cartwright (Patent No. 2281475) disclosed both pre-heating the optical surfaces prior to evaporating the coating in the vacuum and post-baking the metallic salt coating. Biggs (Patent No. 2123706) disclosed heating in the vacuum during evaporation of metal on the inside of a

lamp bulb. Fink (Patent No. 1738991) disclosed the use of the same process to coat with metal the inner surface of a thermos bottle to produce a reflective coating. Winkler (Patent No. 1982774) disclosed the same process with metal to coat mirrors. It also referred to post-baking in air and to electrical discharge in vacuum. Long (Patent No. 2236911) also dealt with coatings of metal on mirrors to make a reflective coating. The publication of Burgers & Dipple (1934) is an academic study to determine the structure of films of inorganic salts to determine their structure. Post-baking is referred to. There is no mention of hardness or of the intent to harden the coatings.

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Cartwright, the patentee in patents already referred to, was co-author with Strong of an article entitled "An Apparatus for the Evaporation of Various Materials in High Vacua." This article was published in "Review of Scientific Instruments," Volume 2, March, 1931. This articles does not disclose any heating in vacuum as a part of a method to secure films of inorganic salts. The reference to the use of heating in vacuum is in connection with the deposition of silver on glass to make a reflective coating. It is significant that Cartwright was still advocating the use of post-baking optical surfaces coated with inorganic salts at the time the plaintiff claims to have made his discovery of heating in vacuum. This was ten years later than the publication of the article above referred to. If this article can be said to suggest the advantages of heating in the vacuum in applying coatings of inorganic salts to optical elements it seems strange that Cartwright himself did not use it. He himself applied for a patent on the inferior and now virtually abandoned method of post-baking long after the publication of the article. Cartwright wrote another article which was published in "Review of Scientific Instruments," Volume One, December, 1930, entitled "Cathode Sputtering." Cartwright admitted in his testimony at the trial

the difference between evaporation coating and sputtering is fundamental and that inorganic salts cannot be applied by sputtering.

The defendant asserts that the patent is invalid because of prior invention, knowledge, use and public use by Cartwright. There is no gainsaying the fact that Cartwright was outstanding in the field of coating optics, nor that he had experimented to discover means of hardening the coatings, nor that the particular process of heating in the vacuum had come to his attention prior to 1941. These admissions pose important questions, i.e., whether Cartwright properly estimated the value of heating in the

vacuum to harden the coatings, and if he did properly estimate its value, whether he brought it to light in the art and urged its adoption. In November, 1939, Cartwright was an instructor at Massachusetts Institute of Technology in the field of physics. As early as November 8, 1939, he had devised a crude apparatus consisting of a metal plate with grooves to receive glass lantern slides to be coated. The plate was heated to various temperatures. Glass slides were inserted in the grooves in contact with the hot metal plate, which was then suspended in a vacuum chamber. By this means the heat of the glass slides was preserved in the vacuum while evaporated coatings of inorganic salts were applied to the slides. The results of Cartwright's experiments with this apparatus were reported in a letter by Cartwright to Mr. Carroll Wilson of Research Corporation, New York City, dated November 30, 1939. Attached to that letter was another page marked "continued December 4, 1939." This latter page referred to equipment for heating glass by radiation while the glass was being treated in vacuum. He reported that "this looks like the logical way to treat photographic lenses during their manufacture as well as eye glasses." Research Corporation as assignee was exploiting by licenses certain of Cartwright's patents, in-

cluding his patent covering post-baking, under an arrangement by which the proceeds were used for research and under which Cartwright received some financial benefit. While Cartwright was at M.I.T. he carried on as a side line a small scale commercial business of coating optical elements for persons and corporations who had become familiar with his work. He devised a crude copper oven open at both ends, containing heating coils, designed to heat lenses electrically while under vacuum. This oven would accommodate one or two lenses. In connection with this commercial work he hired a student named Clark to assist him. This commercial work was

carried on in an M.I.T. laboratory when students were not using the laboratory. Clark hardened the coatings by post-baking and on occasions by heating in the vacuum, using the copper oven. This was during the scholastic year ending in May, 1940. Clark was then hired by National Research Corporation, Boston (not to be confused with Research Corporation), in charge of the development of lens coating. He was hired because of his experience in high vacuum work and his knowledge of coating lenses. When he was about to leave M.I.T. to go to National Research Corporation, he had a discussion with Cartwright regarding the method of vacuum heating for hardening coated lenses. Cartwright regarded National Research Corporation as a potential competitor of his in his commercial enterprise. Cartwright told Clark that he wanted to work on the method of heating in vacuum a little more and did not want it to be known publicly at that time (May, 1940). He asked Clark not to divulge this method of coating at that time. Clark complied with Cartwright's request, and although employed at National Research Corporation until October, 1942, he never used nor disclosed any method for hardening except post-baking. His calculated suppression of the idea and of the use of heating in the vacuum was directly attributable

to Cartwright's request to Clark not to divulge the idea because Cartwright did not want it to be known publicly.

In May of 1940, at the particular time that Cartwright expressed to Clark his desire that the idea of heating in the vacuum to harden coatings should not become public knowledge, the Navy was interested in the application of thin films to submarine periscopes. Cartwright left M.I.T. about August 1, 1940, to take a position as the head of the research department at Corning Glass Works. But before commencing his work at Corning Glass Works he was hired under contract with the Navy for compensation to go to the Naval Research Laboratory at Washington

for one month to install for the Navy a technique in coating optical elements and to instruct personnel of the Naval Research Laboratory in the basic principles of high vacuum technique and anti-reflection coatings. He spent the month of August, 1940, at the Naval Research Laboratory in Washington. He took with him vacuum equipment that he had constructed for use in his employment at the Naval Research Laboratory. While there under contract he coated the lenses of a submarine periscope. These coatings were hardened by post-baking only. They turned out to be soft and unsuitable and could be brushed off with a camel's hair brush. As far as hardness was concerned, they were a failure. Cartwright says the reason for their lack of hardness was his inability to secure a good vacuum in the short time that he was employed at the Naval Research Laboratory. It is important to note however that Cartwright did not take to Washington for use in his employment at the Naval Research Laboratory his crudely constructed copper oven or any other equipment designed for use in heating in vacuum for hardening, and that he never intended to use the method of heating the lenses in vacuum for hardening the coatings during his work at the Naval Research Laboratory. At no time during his work there did he ever disclose to

anyone the idea that evaporated coatings could be made more rugged by the use of heating in the vacuum.

Directly after his work at Naval Research Laboratory in August, 1940, he commenced his employment at Corning Glass Works. He supplemented his salary there by continuing his commercial enterprise of coating lenses. This work he did with the assistance of his wife in the basement of his home, and she usually applied the coatings. The testimony of Cartwright and his wife regarding the use of heating in the vacuum for hardening in his commercial work at Corning prior to Lyon's claimed invention is vague, uncertain, unsupported by any docu-

mentary evidence (although there is documentary evidence of post-baking), and unpersuasive. This proof of anticipation does not measure up to the quality of proof required to defeat a patent. *The Barbed Wire Patent*, 143 U. S. 275. On all the evidence regarding Cartwright's experiments, and his work with heating in the vacuum for hardening evaporated coatings, I conclude that Cartwright did not appreciate the benefits of heating in the vacuum, and that any such use by him was sporadic and inconclusive as to any definite advantages obtainable. He did not properly evaluate the results obtainable by heating in the vacuum to harden evaporated coatings. Certainly he did not bring it to light in the art, nor urge its adoption. Quite the contrary, the suppression of whatever Cartwright had discovered regarding the use of heating in the vacuum was due to his own efforts to withhold it from public knowledge and to his own failure to disclose it in his work at Naval Research Laboratory when he was under contract for compensation to give the United States Navy the benefit of whatever knowledge he had that could be used in applying evaporated coatings to optical elements for the Navy. I am not persuaded by the evidence that Cartwright concealed or withheld the idea and use of heating in the vacuum for hardening with

knowledge that that was the best method for obtaining hard and rugged coatings. I think rather that whatever experiments he had conducted along that line and whatever occasional use he had made of it in his commercial work had convinced him that it was inferior in results to his own patented post-baking method, and that the results obtained were not worth the effort, and did not warrant bringing it to light in the art. Even today when virtually the whole industry has abandoned post-baking, Cartwright is still not convinced that heating in the vacuum is superior to post-baking. His testimony at the trial leaves no doubt about the fact that he is still un-

certain whether one "could not get as hard a film if you left out the actual heating in the vacuum." And he admitted in his testimony at the trial that that was the way he felt about it in 1940 and 1941. Since Cartwright's use did not in fact contribute to the art, he should not be deemed a "first inventor" of the process. *Gillman* v. *Stern*, 114 F. 2d 28, 31.

Cartwright was not alone in attempting to improve the quality of ruggedness of evaporated coatings. Hewlett, a distinguished scientist employed in research at General Electric Company, began intensive work directed to the improvement of non-reflecting films on glass in January, 1938. One of the problems with which he was confronted early in his work was that of making the coatings more durable. Some time in 1940 he conducted experiments using heat in the vacuum while the coatings were being evaporated onto glass. His immediate interest at that time was in connection with the development of a non-reflecting glass cover for photographic light meters. In all of his experiments in which he used heat in the vacuum during evaporation, he used it in connection with other steps designed to improve the ruggedness of the coatings, including pre-heating and post-baking in air. None of his experiments were designed to show the results of heating

in the vacuum alone. His final experiment using heat in the vacuum conducted on July 30, 1940, was designed to answer the question whether it is necessary to have the glass plate hot while it is receiving the evaporated coating. In this experiment he also used pre-heating and post-baking in air. He concluded by this final experiment that heat in the vacuum was not a necessary step and thereafter he made no attempt to incorporate that step in his work of making non-reflecting films. As a result of his experiments Hewlett concluded that pre-heating, the securing of a high degree of vacuum, and post-baking were the important steps to secure rugged films, and that hav-

ing performed those steps he regarded heating in the vacuum as an unnecessary step, and he therefore abandoned any further efforts in the use of heating in the vacuum. It is interesting to note that Dr. Hewlett's diary contained an entry dated July 28, 1940, two days before Dr. Hewlett's final experiment which led to the abandonment of the step of heating in the vacuum, which recite that Dr. Coolidge (one of Hewlett's associates at General Electric) had written to Cartwright's representatives to find out the details of Cartwright's procedure for hardening and waterproofing films. The reply to the request was a short communication stating the essential points to be (1) pre-heating; (2) post-baking; (3) cooling the glass and the immediate application of a waterproofing agent. No reference was made to the use of heat in the vacuum. This was immediately prior to Cartwright's employment at the Naval Research Laboratory. Cartwright had previously used heating in the vacuum along with his post-baking and had so informed Hewlett in November, 1939. Cartwright's reply referred to in Hewlett's diary lends support to the conclusion that Cartwright did not properly evaluate the advantages of heating in the vacuum and that by July of 1940, he also had abandoned its use. This would explain Cartwright's

failure to disclose the idea of heating in the vacuum during his employment at Naval Research Laboratory in August of 1940. Unlike the inventor in *Corona Cord Tire Co.* v. *Dovan Chemical Corp.*, 276 U. S. 358, relied on by defendant, Hewlett did not reduce the use of heating in the vacuum to practice so as to demonstrate the practicability of the process. His experiments led him to the exact opposite conclusion, namely, that it was not practicable and he therefore abandoned it.

Joseph Beggs was employed at Eastman Kodak Company. From the Fall of 1939 to the Fall of 1940 he was employed in the Laboratory at Kodak's Hawkeye Divi-

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sion, where work on non-reflecting films on lenses was being carried on. Up to that time, Kodak's work on hardening magnesium fluoride coatings had been done mainly by post-baking. The coatings produced were still not hard enough to withstand ordinary cleaning methods. The use of coatings was therefore restricted mainly to inside surfaces. Beggs conducted one experiment using heat in the vacuum for hardening. He utilized the tungsten filament of an incandescent lamp bulb to supply the heat. He said this method produced a harder coating than the post-baking method. If any appreciable advantage was uncovered from Begg's experiment, it had no discernible impact on Kodak's methods of hardening. Apparently the result of Begg's experiment went unnoticed by his superiors responsible for Kodak's program for coating lenses. There was no activity in the Kodak laboratory involving the use of heat in the vacuum from the time of Begg's experiment in April, 1940 to the time the Lyon's process was adopted in production at the urging of the United States Navy. Its use by Kodak was urged by the Navy in 1943, but it was not actually adopted until 1944. On February 24, 1941, a report was made by Dr. McLeod, in charge of Kodak's program of coating lenses, on the subject "Proposed Experiments In

Coating With Fluoride." This was a resume of the progress of experimental work on coating. It is noteworthy that it made no mention of the idea of heating in vacuum. Another report, dated September 30, 1941, was made by Dr. McRae of the Kodak laboratory on the subject "Report on Progress of Development and Experimental Work in Lens Coating." The methods of hardening discussed in the report were the use of preheating by an oxy-hydrogen flame, post-baking and glow discharge. At this time Kodak was still searching for means to improve the ruggedness of evaporated coatings. Post-baking and the use of oxy-hydrogen flame had been

abandoned. The method of glow discharge was then regarded as the most promising. No reference was made in that report to the Begg's experiment using heat in the vacuum. For all practical purposes, Begg's idea of using heat in the vacuum had been abandoned. Early in 1943, Lyon's successful use of heat in the vacuum at the Naval Gun Factory came to the attention of Kodak officials. Then for the first time the Begg's experiment was reanimated. Beggs left Kodak's employment in August, 1942, more than two years after his experiment in April, 1940. On April 17, 1943, Kodak filed a patent application in the name of Beggs. After the issuance of the Lyon's patent on April 16, 1946, Kodak's Patent Department copied the claims of the Lyon's patent in the pending Begg's application, thus provoking an interference in the Patent Office.

This interference was subsequently settled by a written agreement dated October 23, 1947, between Kodak and Lyon which provided for the assignment by Kodak to Lyon of the Beggs application, subject to the reservation that Kodak should have the irrevocable royalty-free right to operate under the Beggs application and any patent which might issue thereon, and subject to a non-exclusive royalty-free license to the United States Government

under the Beggs application. The agreement also provided for the grant to Kodak of a paid-up non-exclusive license to operate under the Lyon patent. The agreement further provided that Kodak was to supply digests of proposed evidence regarding Begg's claimed invention to the plaintiff's attorney. In accordance with this agreement, Kodak did supply digests of the proposed evidence regarding Begg's claimed invention. In the interference it was claimed by Kodak that Beggs had completed the invention early in 1940. Lyon was advised by his attorney that in the light of all the available evidence he had priority as to the invention involved in the interference.

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The interference was dismissed accordingly. On the evidence at the trial, Lyon's claim to priority over Beggs was justified. There is no support in the evidence for the defendant's charges of fraud on the Patent Office and the public, suppression of evidence as to priority of invention, or secrecy, in connection with the agreement between Lyon and Kodak for the settlement of the issues involved in the interference proceeding.

Neither Hewlett nor Beggs contributed any new information to the art. Their work therefore may not be held to anticipate plaintiff's invention. *Metallizing Engineering Co.* v. *Kenyon* (*supra*), page 519.

The defendant contends that the patent is invalid by reason of public use by the Navy and by the plaintiff more than a year prior to the filing of the application for a patent. Lyon made his claimed invention in June, 1941, while in the employment of the United States Navy as a civilian employee at the Naval Gun Factory. He continued in his employment at the Naval Gun Factory conducting further experiments and tests in perfecting the invention and in preparation for production. His application for a patent was filed November 17, 1942. This defense calls for an examination of the nature of plaintiff's use of the invention between June,

1941, the claimed date of invention, and November 17, 1941, one year before the filing of plaintiff's patent application. Lyon was not ready to say in June, 1941, that the coatings produced were such as would suit the needs of the Navy. Tests were required to demonstrate that the coatings would be satisfactory to the Navy, including abrasion tests, soaking the films in water, subjecting the coated lenses to salt sprays and subjecting coated lenses to actual use. Machines had to be designed for use in production. The development was still in an experimental and testing status in the fall of 1941. All of this development work looked forward to production in 1942.

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In September, 1941, test coatings were applied to a small number of old World War I binoculars, which were used for such application by arrangement with the Navy officer in charge of the optical shop. These coated instruments were introduced into the assembly line without informing the personnel that the elements were coated. They were handled in the normal routine manner. This test demonstrated successfully the uniformity of the coatings from an optical viewpoint, and gave assurance that the coated elements would stand the normal handling of routine assembly. It was then decided to make a test application of coatings to larger and more complicated instruments. Coatings were accordingly applied to the elements of one of the telescopes in production in the Naval Gun Factory. This test proved successful both as to light transmission and durability of the coatings. By that time, October, 1941, it was decided by officials of the Navy that experimental work had developed as to such a stage as would warrant the placing of the process in production. Funds had to be procured for the purchase of necessary equipment. On October 30, 1941, funds were authorized. By December 30, 1941, a list of items of necessary equipment, which was thereafter to be purchased for produc-

tion units, had been prepared. In January, 1942, it was decided to apply the process to a set of optical elements of a submarine periscope. This was done and the test proved successful. In the Summer of 1942, the first production of submarine periscopes with optical elements coated by the Lyon process was had in co-operation with the Kollmorgen Optical Co., the manufacturers of submarine periscopes. All of this work in development of the invention up to the time of first production and for a long period after that, was surrounded by the strictest secrecy under Navy orders and regulations. The patent application was kept in strict secrecy. The plaintiff was ordered by the Commissioner of Patents not to publish

or disclose the invention. The plaintiff had no private coating laboratory; he never sold any optical instruments or lenses coated in accordance with the invention. He took no action at all to realize any profit from the invention until after the issuance of the patent in 1946.

It is clear from the evidence that on November 17, 1941 there had been no production at all. The status of the invention at that date was that development had progressed to such a point that funds had been authorized for the purchase of necessary equipment for production units. It was not until December 30, 1941, almost a month and a half later, that a list had been prepared of items of necessary equipment to be purchased for production units, and not until the Summer of 1942, that the first production using the Lyon process took place in coating the elements of submarine periscopes in co-operation with Kollmorgen Company. Defendant does not make it clear what particular use is claimed to be a public use so as to defeat the patent, but rests its argument on a statement in the brief not substantiated by the proof, that the process was a success from the start and was carried on continuously from June, 1941, throughout the War. From this it argues that the use of a process by a patentee in making and using

the process for its intended purpose for more than a year prior to his filing date requires application of the principle of forfeiture to invalidate the patent, even where the use of the process is secret and cannot be ascertained from the product. For its argument it relies on *Metallizing Engineering Co. v. Kenyon*, 153 F. 2d 516, and cases approving that decision. That case holds that it is the nature of the inventor's use more than one year before filing his application which controls, and if he is using the invention commercially, for profit, his patent is invalid. There is no quarrel with the doctrine. The trouble with the argument is that the facts as to the plaintiff's use and the Navy's use of the invention prior to November

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17, 1941, do not fit the doctrine. There was no use at all either by the plaintiff or the Navy prior to November 17, 1941, except experimental use to demonstrate uniformity of the coatings from an optical viewpoint and durability of the coatings.

The plaintiff has a valid patent. The defendant has infringed the patent by its use of the process covered by the patent in its commercial manufacture of optics not made for use of the United States Government.

By amendment allowed at the trial, the plaintiff stated a second cause of action alleging that the defendant acquired its information and knowledge regarding the process covered by the patent under confidential disclosures made to the defendant while the invention was maintained in a secret status by the Navy Department, and that this confidential information was given to the defendant for the sole purpose of allowing the defendant to practice the invention in making optical elements for the Navy, and that the defendant, without obtaining plaintiff's permission, wrongfully made use of such confidential disclosures and proceeded to use such confidential information for its own non-governmental work and thereby

profited from such wrongful use and was unjustly enriched thereby at plaintiff's expense. In the original complaint the plaintiff invoked the jurisdiction of this court upon the ground that the suit was one under the Patent Laws, infringement of U. S. Patent No. 2,398,382, being charged in the complaint. Upon amending the complaint to state a second cause of action, no other ground of jurisdiction was stated. Regardless of that, I think that the second cause of action may fairly be construed to assert a claim of unfair competition related to the cause of action for patent infringement, and that this court has jurisdiction thereof under 28 U. S. C. A. 1338 (b).

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Defendant's use of the process in its non-governmental work commenced at about the time that the plaintiff wrote the defendant calling its attention to the fact that he had received a patent. From the time of the issuance of the patent the information regarding the process was public knowledge. Therefore the use by the defendant of the process after the issuance of the patent was not wrongful, apart from the risk of infringement. *Schreyer v. Casco Products Corp.*, 190 F. 2d 921, 924. It is true that the defendant became skilled in the operation of plaintiff's process prior to the grant of the patent, and that this circumstance gave the defendant the advantage of being able to commence promptly to use the process on its non-governmental work. This advantage, however, so acquired was an unavoidable incident to the lawful use of the process by the defendant in performing its government contracts for the manufacture of the optics for the Navy. Since there was no unlawful use of the process prior to the issuance of the patent, the defendant may not be held to have been unjustly enriched by making use of confidential disclosures regarding the process.

The plaintiff should have judgment providing for; an injunction against further infringement by the defend-

ant; an accounting for profits and damages resulting from the infringement; ordinary taxable costs. Separate findings and conclusions are filed herewith.

HAROLD P. BURKE
U. S. District Judge

December 31, 1953.

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Findings of Fact

UNITED STATES DISTRICT COURT,

WESTERN DISTRICT OF NEW YORK.

[SAME TITLE.]

1. The suit herein for infringement arises under the Patent Laws of the United States. The cause of action for unfair competition is related to the claim for infringement.

2. Plaintiff is the owner of the entire right, title and interest in United States patent No. 2,398,382 dated April 16, 1946.

3. A search for a practical means to reduce light reflection from optical surfaces has been going on for at least 50 years. It was known as early as 1936 that coatings of metallic fluorides, when deposited on the surfaces of the optical elements in vacuum would reduce light reflection. In the years 1936 through 1942 skilled scientists were working intensively to improve the hardness and durability of such films. It was generally recognized during this period that the soft or fragile nature of such films had to be overcome before they could be brought into practical and widespread use. Such efforts were exerted by Eastman Kodak Company, General Electric Company, Research Corporation of New York, using the work of Dr. C. Hawley Cartwright, National Research Corporation and the Navy Department of the United States

Government. Various methods to solve the problem were employed in these efforts, including: (a) post-baking and pre-heating, (b) intense cleaning of the optical surfaces by the use of an oxy-hydrogen flame, (c) cleaning of the optical surfaces and the interior of the vacuum chamber or bell jar by a method known as glow discharge, and the use of special electrodes in connection with the glow discharge method.

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4. These efforts were unsuccessful from a practical standpoint, although some of them were used to a limited extent. They were all supplanted and made obsolete by the method of the patent in suit, which discloses a method of securing hard films of this type by heating the optical surfaces to an elevated temperature while in the vacuum chamber and evaporating the inorganic salt coatings onto the surfaces while they are maintained at an elevated temperature in the vacuum. The method employing post-baking and pre-heating had been given wide publicity. This method was developed and advocated by Cartwright and Dr. Arthur F. Turner, employed by the defendant. It involved heating the optical elements in the outside air, prior to evaporation of the inorganic salt coating in the vacuum, and baking the optical elements thus coated in air after evaporation. This was generally known as the Cartwright post-baking method. The oxy-hydrogen flame treatment was the subject of experiments by Eastman Kodak and it involved playing a very hot flame upon the surfaces of optical elements to thoroughly clean them, before placing them in the vacuum for evaporation. The glow discharge method involved the cleaning of the lenses and the interior of the bell jar by ionic bombardment. This practice was widely known in the art and was used by Eastman Kodak and others. The defendant also used the glow discharge method in an attempt to secure harder coatings.

5. During this same period there was some commercial production of optical lenses coated with transmission films of inorganic salts. Both Eastman Kodak and defendant produced such coatings. The coatings were applied to optical elements when the latter were in a cold condition, and in some instances the coated lenses were thereafter treated with the post-baking process. Coatings thus produced were relatively soft. The optics so coated

required careful handling, and the coatings were applied only on the inside protected surfaces of the optical instruments. During the same period the Cartwright post-baking method was widely promoted by Research Corporation of New York and the National Research Corporation of Boston.

6. These methods, as used commercially to a limited extent, were later supplanted by the entire industry, by the process of the patent in suit, due to the success of the process, as demonstrated when it was adopted by the United States Navy. The method of coating on cold surfaces as produced by defendant, was so limited in use, and was so unsatisfactory from a standpoint of durability, that defendant in 1941 recommended to the Navy Department that the evaporation process be abandoned. At that time the defendant also recommended an entirely different process known as "leaching," a chemical process, which was also later abandoned when the plaintiff's process was successfully demonstrated. The glow discharge method was used to a limited extent, notably by Eastman Kodak Company, but it was not dependable. The post-baking process was likewise not dependable and was found to be unsatisfactory by the Navy when Cartwright employed it under contract with the Navy in an attempt to coat the lenses of submarine periscopes in August, 1940. Then lenses so coated were a failure from a standpoint of hardness and durability of the coatings.

7. The plaintiff was employed by the United States Navy at the Naval Gun Factory in Washington as a civilian employee. He commenced work in January, 1941, and he was assigned to develop a Navy program in setting up the production of coated optical elements for Navy use. In the early months of 1941 he studied the existing knowledge of the subject and visited various facilities which were working with the Navy Department

in an effort to obtain coatings of satisfactory durability. He visited the facilities of the defendant and of the Eastman Kodak Company, and the facilities of National Research Corporation. He found that the coatings then being applied were not sufficiently hard and durable for the Navy's purposes. He was thus faced at the outset with the difficulty of lack of hardness of the coatings, which had baffled the most skilled in the art through the preceding years when intensive efforts were being made to solve the problem. The persons most skilled in the art had not discovered the invention of the patent in suit and had not appreciated that unusual results could be obtained thereby in securing harder films by practicing the method as defined in the patent in suit.

8. During the early part of June, 1941, in the course of plaintiff's efforts to get into production for the Navy Department, using the then known techniques, for hardening, he made the discovery that is the subject of the patent in suit, i.e., that coatings of much greater hardness and durability could be consistently obtained by practicing a method in which the optical elements were heated to an elevated temperature in the vacuum, and in which the inorganic salts were evaporated onto the heated surface while they were so maintained in the vacuum. Plaintiff made his discovery independently, and did not acquire knowledge of the invention from the prior art or from any of the facilities which he had visited. He continued to

work on this discovery and around the first of July, 1941, he was reasonably certain that he had discovered a successful method and at least as early as that date he had disclosed the method to others and had actually practiced it for others.

9. In the remaining months of 1941 he proceeded with further exhaustive experiments and tests to prove the consistent durability of the films applied in accordance

with the method of his discovery. Early in 1942 plans were made for final production experiments in applying the films to submarine periscopes for use by the Navy. In the Spring of 1942, in cooperation with the Kollmorgen Optical Company of Brooklyn, manufacturers of submarine periscopes for the Navy, final experimental coatings of submarine periscope lenses was carried out. These final tests were so successful that orders were issued by the Navy Department to go into full production using the invention, in coating all submarine periscopes. Toward the middle of 1942, this production work was underway at the Naval Gun Factory and later in the year at the Kollmorgen Optical Company. This work was so successful that all submarine periscopes both new and in service were successfully coated with the plaintiff's process.

10. Following this successful work the plaintiff's method was applied by the Navy to virtually all important optical equipment, including binoculars, gun director telescopes, spyglasses and range finders. The success of the process was so outstanding that priorities were established for coating the optical instruments of all war vessels, particularly combatant ships, in accordance with the plaintiff's method, as soon as the availability of the ships would permit, and the method was applied to the optics of both new construction ships, and ships in service. Numerous repair ships and tenders of the Navy were especially

provided with equipment to apply the process at points adjacent to combat areas. The plaintiff's invention greatly benefited the United States Navy and was regarded by the Navy as the most important development in submarine periscopes in recent years. Plaintiff received special citations from the Chiefs of the Bureau of Ships and Ordnance of the Navy Department, and later by the Secretary of the Navy. The plaintiff's invention was also

adopted by the Army for its optical equipment, and later by the industry in general.

11. Plaintiff's discovery brought forth a method which was the first to produce transmission type inorganic salt coatings of such consistent hardness and durability as to permit mass production of optical equipment with such coatings applied to both outside and inside optical surfaces, although the need for such hard and durable coatings had been apparent for many years.

12. The application for the patent in suit was filed by the Navy Department on November 17, 1942. There was no public use of the invention for more than one year preceding this date. The plaintiff's work was classified as military secret and the work which plaintiff conducted during 1941 was experimental and was carried out at the Naval Gun Factory under existing secrecy regulations. Plaintiff made no effort to exploit his invention commercially nor to profit in any way therefrom. Plaintiff had no private business involving the practice of the invention for profit, until after the war and after the issuance of his patent, when he began to license the patent.

13. Late in 1942, the defendant requested permission to send certain of its scientists, including Dr. A. F. Turner, to the Naval Gun Factory to visit the plaintiff and to learn the details of his process, for purposes of the application by the defendant of this method to optical equip-

ment being supplied to the Navy. Plaintiff disclosed full information on his discovery and method to the representatives of defendant for this purpose. Upon receiving this information, defendant recognized that the plaintiff's method had achieved superior results, as far as the hardness and durability of the films was concerned and that the films produced by plaintiff's method were superior to those previously produced by the defendant. Defendant recognized at this time that the plaintiff's method dif-

(935a)

fered from its own prior practices in respect that the optical elements were heated to an elevated temperature in the vacuum and coated with the inorganic salts while maintained at the elevated temperature in the vacuum.

14. Defendant commenced production of optics for the Navy in the Fall of 1942, using the plaintiff's method, and by 1943 such production was fully underway. During the war defendant produced millions of dollars worth of binoculars for the Navy Department, using plaintiff's method.

15. Defendant also recognized the importance of plaintiff's method from a commercial standpoint in respect to the hardness and durability of the films produced by the method. Toward the end of 1945, defendant publicly advertised to prospective customers that an outstanding development had been made during the war in securing films of increased hardness. In this publicity, defendant claimed credit for the origination of the technique which gave the harder coatings, and promised prospective customers that the advantages of this technique would be made available to them by the defendant after the war. This improved technique for securing harder films, as referred to in these advertisements, was admittedly originated by plaintiff and not by the defendant as was claimed in these advertisements.

16. The plaintiff's patent issued on April 16, 1946. At about this time defendant commenced to sell lenses commercially which were coated in accordance with the plaintiff's process. This commercial exploitation of the method, by defendant, was done without obtaining permission from the plaintiff. Shortly after the issuance of the patent in suit, the plaintiff requested the defendant to take a license under the patent. There were some negotiations between the parties, which did not result in any agree-

ment because the defendant was unwilling to pay the royalty which the plaintiff requested. At the time defendant commenced this commercial work, it was aware that it was producing the method covered by the plaintiff's patent. Up until this time, plaintiff had made no effort to exploit his invention commercially, nor in any way to derive profit from it. He had devoted all of his efforts to developing the use of the invention for the navy and army during the war.

17. Other optical companies also adopted the plaintiff's method for their commercial work at about this time. A number of these companies, including the Kollmorgen Optical Company, which had been active in coating the first submarine periscopes with the method of the invention, entered into license agreements with the plaintiff on royalty terms the same as had been offered by plaintiff to the defendant. The royalty which the plaintiff requested was reasonable.

18. In the period following the issuance of the patent plaintiff's method was receiving widespread use throughout the industry. The impact on the industry of the use of plaintiff's method was substantial, other methods such as post-baking being supplanted. The records of the Research Corporation, as of that time, indicate that the licensing program which that company had set up under the Cartwright patents was paralyzed by the widespread

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adoption of the plaintiff's invention. The plaintiff's method is today accepted and used throughout the entire optical industry.

19. The defendant is an important and leading company in the optical industry. Several companies which were approached by the plaintiff refused to take a license because of the position taken by the defendant with respect to the patent. Defendant's knowledge of plaintiff's

process and the use of the same during the war for government purposes gave it a great advantage in immediately switching the process over to commercial use at the end of the war.

20. The defendant now uses the method of the patent in suit for all of its commercial work. Defendant could avoid infringement and practice in accordance with its pre-war method, which it contends was satisfactory for all commercial work, by simply omitting to turn on the switch which controls the heater for the optical elements in the vacuum chamber.

21. Eastman Kodak Company also learned of the patent in suit from the plaintiff, when its scientists visited plaintiff at the Naval Gun Factory early in 1943. Plaintiff disclosed the details of his method to these representatives of Kodak at that time. Upon receiving this information, Kodak recognized that the plaintiff's method produced much harder and more durable coatings than those which had been previously obtained by Kodak, and that plaintiff's method differed from Kodak's prior practices in the respect that the optical elements were heated to an elevated temperature in the vacuum and maintained at an elevated temperature therein while the evaporated coatings were being applied. In late 1943, or early 1944 Kodak also applied the plaintiff's method to the production of optics on an extensive scale in government work and later used it in commercial work.

22. Kodak also recognized the commercial possibilities and value of the plaintiff's method and shortly before the end of the war, in 1945, Kodak publicly advertised that an important technique had been developed during the war which provided harder and more durable coatings, and it also claimed to have originated this technique.

(938a)

23. Kodak, after acquiring knowledge from plaintiff of the success of his method, filed a patent application on the same method in the name of one Beggs, who was no longer an employee of Kodak at that time. This application was filed because of the knowledge acquired of the plaintiff's discovery and the success of his method, and purported to be based on some experimental work of Beggs, which had long before been abandoned, and which had been conducted early in 1940.

24. Whatever work Beggs had done in 1940 was nothing more than an abandoned experiment. There was no evidence of any activity at Kodak on any invention by Beggs in the three years after his experiment and up until the time the Beggs application was filed on April 17, 1943, after the Kodak's patent attorneys had learned about the success of plaintiff's work. There were no authenticated records of any kind at Kodak referring to the Beggs work during this period, although Kodak had a large and well organized patent department and elaborate machinery for recording any important developments or experimental work. On the other hand, there were numerous reports in Kodak's files showing activity along other lines, such as the unsuccessful efforts to solve the problem by the use of oxyhydrogen flaming, by post-baking and by glow discharge.

25. Kodak reanimated this abandoned experiment of Beggs and used it as a device to exact a license from the plaintiff by provoking an interference with plaintiff's patent after it had issued, and by alleging under oath that

Beggs had earlier conceived and diligently developed the invention. The plaintiff properly disposed of this interference after he had received an assignment of the Beggs application from Kodak under a settlement agreement between plaintiff and Kodak and when plaintiff learned of the lack of any evidence at Kodak which would prove

invention by Beggs, by leaving the claims in the Lyon patent where they had been originally granted. Any experimental work which was done by Beggs did not anticipate the invention of the patent in suit.

26. The plaintiff did not unlawfully suppress the Beggs patent application. The plaintiff's action in retaining the claims which were the basis of the interference in the patent in suit was lawful and proper.

27. Dr. C. Hawley Cartwright commenced work on vacuum deposition of films as early as 1928. He carried on experiments at Massachusetts Institute of Technology during 1938 and 1939, seeking a way to harden the transmission type films of inorganic salts. In November, 1939, Cartwright was an instructor in the field of physics at Massachusetts Institute of Technology. As early as November 8, 1939, he had devised a crude apparatus consisting of a metal plate with grooves to receive glass lantern slides to be coated. The plate was heated to various temperatures, glass slides were inserted in the grooves in contact with the hot metal plate, which was then suspended in a vacuum chamber. By this method the heat of the glass slides was preserved in the vacuum while evaporated coatings of inorganic salts were applied to the slides.

28. While Cartwright was at M.I.T. he carried on as a side line a small scale commercial business of coating optical elements for persons and corporations who had become familiar with his work. He devised a crude copper

oven open at both ends, containing heating coils, designed to heat lenses electrically while under vacuum. This oven would accommodate one or two lenses.

29. This commercial work was carried on in an M.I.T. laboratory when the students were not using the laboratory. He hired a student named Clark to assist him in

this work. Clark hardened the coatings by post-baking and on occasions by heating in the vacuum, using the copper oven. This was during the scholastic year ending in May, 1940.

30. Clark was then hired by National Research Corporation of Boston in charge of the development of lens coatings. He was hired because of his experience in high vacuum work and his knowledge of coating lenses. When he was about to leave M.I.T. to go to National Research Corporation, Cartwright told Clark that he did not want his work of hardening by heating in the vacuum to be known publicly at that time, and that he wanted to work on it a little more, and he requested Clark not to divulge this method of coating. Clark complied with Cartwright's request and although employed at National Research Corporation until October, 1942, he never used nor disclosed any method of hardening except post-baking. This suppression of the idea and the use of heating in the vacuum was directly attributable to Cartwright's request to Clark not to divulge the idea because Cartwright did not want it to be known publicly.

31. Whatever experimental work and commercial work Cartwright may have performed at M.I.T. involving heating in the vacuum in filming with inorganic salts and later at Corning, N. Y., was sporadic and inconclusive and not of such nature as to invalidate the patent in suit. The evidence with respect to his work both at M.I.T. and Corning, both experimental and in his limited commercial work

is uncertain and inconsistent. He did not realize any exceptional advantages which would accrue from using heat in the vacuum because he never did isolate the step of heating in the vacuum from other steps which he employed. He took active and extensive steps to maintain such knowledge as he had about the method in secrecy. He did some coating with these films of inorganic salts

on a limited basis in his home but the evidence shows that he used his post-baking process mainly. The work of Cartwright did not anticipate the invention of the patent in suit.

32. Whenever Cartwright or his assignee had opportunity to advise anyone who was interested as to the best method for hardening evaporated coatings, they advised post-baking. Whenever Cartwright had opportunity to demonstrate his method, he used post-baking. He enjoined his associates at M.I.T. to secrecy with respect to any benefits which might result from the method of heating in the vacuum and Clark maintained any knowledge he had on this subject in secrecy, and withheld it from his employer, National Research Corporation and from the United States Navy when he was sent to Pearl Harbor in 1942 to assist in coating the optics of periscopes of submarines which were coming in from combat. As a result, the optics of these periscopes which were coated were soft and unsuitable.

33. Cartwright was engaged under contract by the Navy in 1940 to coat the optics of a submarine periscope in association with Kollmorgen Optical Company, at the Naval Research Laboratory. He did not use heating in the vacuum doing this work but rather used post-baking. The results were a failure from the standpoint of hardness. He had no intention of using the step of heating in the vacuum in his work at the Naval Research Laboratory in 1940.

34. Throughout the history of the development of this art Cartwright advocated, practiced and patented post-baking. He was widely identified with this method. He greatly influenced those working in the art in the belief that post-baking was the method that would secure the harder coatings. Whatever knowledge he may have had from heating in the vacuum he maintained in secrecy.

(942a)

Whatever experiments he had conducted along that line and whatever practical use he had made of it in his commercial use had convinced him that it was inferior in results to his own post-baking method and that the results obtained were not worth the effort and did not warrant bringing it to light in the art. Up to the time that plaintiff's patent application was filed, and even after that time and up to the present time, Cartwright did not appreciate the benefits of heating in the vacuum. He did not properly evaluate the results obtainable of heating in the vacuum. He did not bring it to light in the art nor did he urge its adoption. On the contrary, whatever he did discover regarding the use of heating in the vacuum was withheld from public knowledge through the affirmative steps taken by Cartwright. These affirmative steps were taken by Cartwright because he had failed to appreciate the advantages obtainable by heating in the vacuum.

35. Dr. Clarence L. Hewlett performed extensive experimental work for General Electric Company in the period from 1938 to 1940 in an attempt to solve the problem of lack of hardness and durability of transmission type films of inorganic salts. He received information from Cartwright that the best way to harden the films was by pre-heating and post-baking. He experimented with a method involving heating in the vacuum in association with pre-heating and post-baking, and immediately concluded in this experimentation in the summer of 1940 that the step of heating in the vacuum was of no advantage.

He did not isolate this step from the other steps which he regarded as more important, which were pre-heating and post-baking. He abandoned any thought of using heating in the vacuum after a short series of experiments and the work of Dr. Hewlett on this subject was an abandoned experiment. He thereafter adopted post-baking as the solution of the problem. The work of Hewlett did not anticipate the invention of the patent in suit.

(943a)

36. There was no evidence of any work by Osterberg and Pride relating to the invention of the patent in suit until long after plaintiff had made his discovery and invention and had successfully reduced it to practice.

37. The plaintiff's discovery of the method described in the patent yielded unexpected results and was an invention of high order. Although prior patents and publications were offered by defendant disclosing heating in the vacuum when coating with metals, the full history of activities of the most skilled working in the art over a period of years shows that such knowledge did not teach plaintiff's discovery in connection with applying films of inorganic salts. It taught nothing to the defendant and its group of skilled technicians, including defendant's Dr. Turner, who had been identified with Dr. Cartwright and was a leader in this field in his own right.

38. The use of heat when coating with metals did not make it obvious to those skilled in the art that unexpected results might be secured using heat when coating with inorganic salts. There is no general equivalence between salts and metals.

39. The solution of the problem of lack of hardness in evaporated coatings as taught in the patent in suit was not obvious to Cartwright nor to Hewlett nor to the corporations working on the problem, including the defendant, Eastman Kodak Company, Research Corporation and National Research Corporation.

40. The prior patents and publications offered by the defendant at the trial were substantially the same in disclosure as those which were before the Patent Office when the patent in suit was granted. The Patent Office Examiner found that the films of inorganic salts, referred to in the patent in suit, were well known for the purpose, and that

the use of heat in the vacuum had been suggested in connection with coating with metals. He found that in the art of coating with inorganic salt films it was believed that the films could be hardened by pre-heating and post-baking. He found that in the art of coating with inorganic salts it had not been suggested to heat the elements to an elevated temperature in vacuum and to evaporate the films thereon while the elevated temperature was maintained in the vacuum. He found that this method was not taught by the prior patents and publications, was not obvious, and the record at the trial fully supports the findings and decision of the Examiner.

41. The plaintiff's discovery was of an inventive and patentable character and was not anticipated by any prior patents or publications, nor by any prior knowledge or public use.

42. The plaintiff did not misrepresent the state of the art to the Patent Office during the pendency of his application. He did represent to the Patent Office that outstanding results had been achieved by the method taught and claimed in his application, particularly that notable success had been achieved in work for the Navy during the war. The whole record shows that the representations made by the plaintiff were true. The Patent Office Examiner was not improperly induced to allow the claims of the patent in suit.

43. The patent defines a new and useful method or process residing in the heating of the optical elements in

vacuum to an elevated temperature and depositing the inorganic salt coatings of the metallic fluorides, such as magnesium fluorides, thereon while they are maintained at this elevated temperature in vacuum.

(945a)

44. The patent does not claim a product. The claims of the patent are not too broad and indefinite and adequately define the invention. The specification of the patent is adequate to teach those skilled in the art how to practice the invention. The record shows that the defendant had no difficulty in interpreting the patent and its claims. The evidence shows that those skilled in the art well knew the materials which were recognized as applicable, in making these particular coatings, and the claims of the patent are not unduly broad, being confined to the materials which were well-known in the art to be applicable for the purpose.

45. Defendant acquired knowledge of the plaintiff's invention under confidential circumstances, and for a limited purpose. The defendant became skilled in the operation of plaintiff's process prior to the grant of the patent. This circumstance gave the defendant the advantage of being able to commence promptly to use the process in his non-governmental work. This advantage, however, was an unavoidable incident to the lawful use of the process to the defendant in performing its government contracts for the manufacture of optics for the Navy. Defendant's use of the process in this non-governmental work commenced at about the time that the plaintiff wrote the defendant calling its attention to the fact that he had received a patent. There was no use by the defendant of the process prior to the issuance of the patent.

46. Defendant's commercial process on its non-governmental work which it now uses, infringes the patent in suit.

(946a)

Conclusions of Law

1. The Court has jurisdiction of the subject matter and of the parties involved in this suit.

2. The patent in suit was properly issued.

3. The plaintiff is the owner of the entire right, title and interest in and to the patent in suit, subject to a free license to the United States Government to use it for Government purposes.

4. The plaintiff's discovery on which the patent is based was of an inventive and patentable character and is not anticipated by the prior art.

5. The patent in suit, including claims 1 through 5, 8 and 9 thereof, is good and valid in law.

6. The plaintiff does not come into court with unclean hands as alleged by the defendant and is not barred from relief thereby.

7. The method which defendant has employed in its commercial operations after the issuance of the patent and prior to the filing of this suit and without permission of the plaintiff incorporates the invention of the patent and infringes claims 1 through 5, 8 and 9 thereof.

8. Because there was no use by the defendant of plaintiff's method, which was disclosed to the defendant in confidence prior to the issuance of the patent, until after the issuance of the patent, the plaintiff cannot recover on his claim of unfair competition and unjust enrichment.

9. The usual presumption of validity arising from the granting of the patent is strengthened by the following: (a) The defendant appropriated and employed in practice the plaintiff's invention in its commercial work rather

than using methods of the prior art; (b) Virtually the whole industry uses the plaintiff's invention rather than the methods of the prior art; (c) The plaintiff's invention was accepted and successfully used in the armament program of the Second World War after prior art methods had been tried and found to be unsuitable; (d) The record at the trial establishes that the plaintiff's discovery was overlooked by the most skilled scientists working in the art for long periods of time on the specific problem of obtaining hard and durable films, even though the solution to the problem was under their very eyes.

10. Plaintiff is entitled to an injunction restraining defendant from further infringing the patent and to an accounting for profits and damages resulting from the infringement, together with ordinary taxable costs. The claim based upon unjust enrichment should be dismissed.

(Signed) HAROLD P. BURKE,
U. S. District Judge.

December 31, 1953.

HAROLD B. WILLEY, Clerk

IN THE

Supreme Court of the United States

OCTOBER TERM, 1955

No. 379

BAUSCH & LOMB OPTICAL CO.,
Petitioner,

v.

DEAN A. LYON,
Respondent.

REPLY BRIEF FOR PETITIONER

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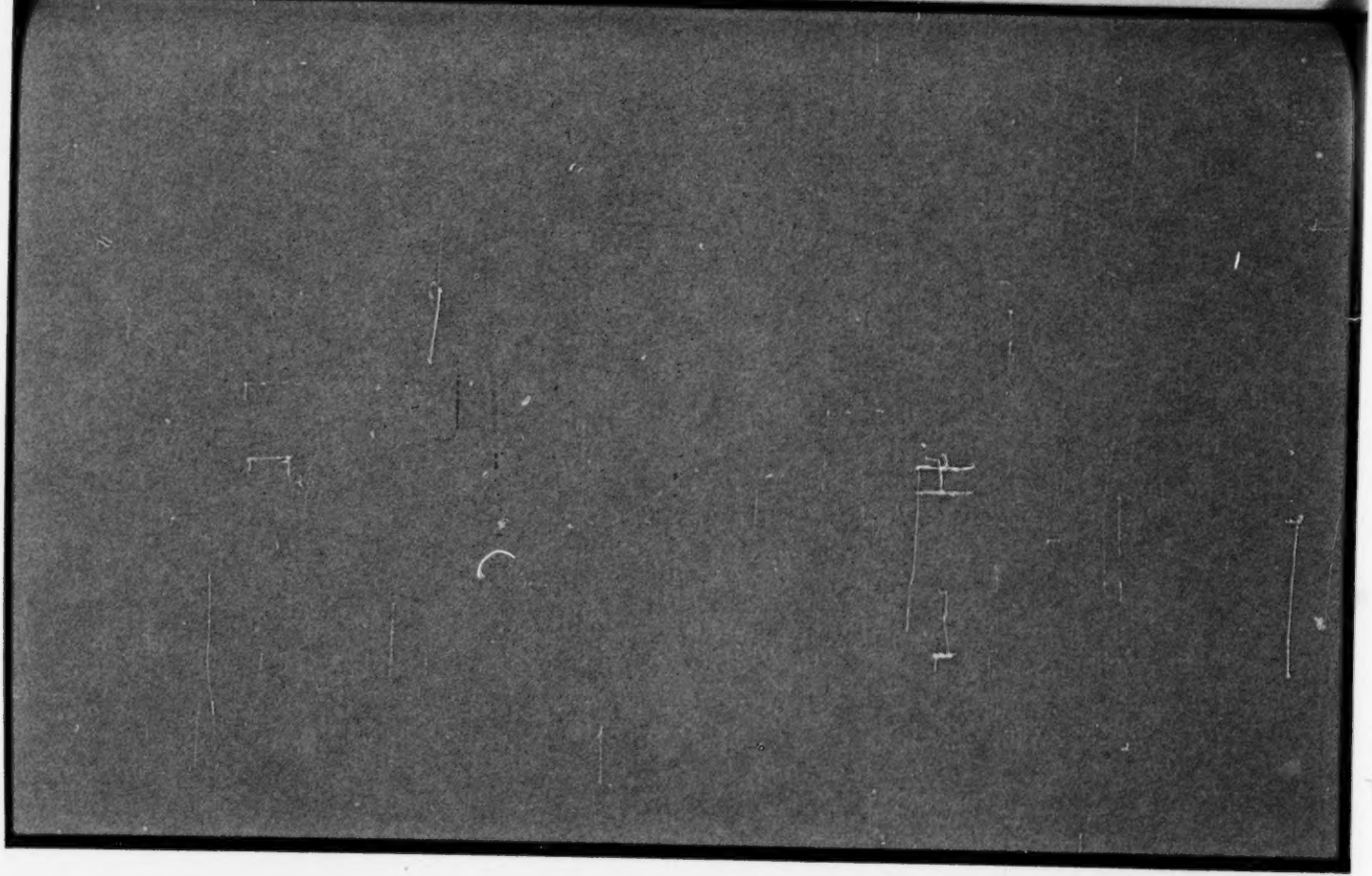

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